Remarks

Claim 5 is here amended. Support for amendment of claim 5 is found in claim 5 as originally filed and in ¶[0016] of the specification as published.

Claims 1-5 are pending in the application. No new matter has been added, and no new material presented that would necessitate an additional search on the part of the Examiner.

Claims comply with 35 U.S.C. §103(a)

The Office Action on page 2 rejects claims 1-5 under 35 U.S.C. §103(a) in view of ¶[0007] of Applicants' specification as published in combination with Cohen et al., Finite Element Methods for Active Contour Models and Balloons for 2D and 3D images, published November 5, 1991

The *Manual of Patent Examining Procedure* states: "[t]o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." [emphases added] *Manual of Patent Examining Procedure* §2142 (8th Ed. Rev.2, May 2, 2004); *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

¶[0007] of Applicants' specification as published

Applicants' specification in ¶[0007] discusses a known method that includes steps of deforming a matched-up model manually (e.g. by displacing a node) after automatic segmentation has taken place. The automatic segmentation is then performed a second time with the deformed model.

The context of ¶[0007] of Applicants' specification is to clearly point out several deficiencies of this prior art method. In fact, these deficiencies are in part a need that is specifically addressed by the method of claim 1. Applicants' specification states:

> What is problematic about this method is that the step of the method in which the internal and external energies are minimized moves the nodes that have been displaced manually back to their original positions, because it is at these positions that the energy of the deformable model is at a minimum. [See Applicants' specification as published, ¶ [0007]; emphases added]

Applicants assert that the prior art discussed in Applicants' ¶[0007] shows only the substantial problems in the prior art and the deficiencies in that prior art, as evidenced by the quotation above. The quotation above clearly shows that Applicants clearly believed at the time the application was filed that the method under discussion in ¶[0007] moves the nodes that have been displaced manually back to their original positions.

Further, the prior art discussed in ¶[0007] fails to teach or suggest a method of segmenting a three-dimensional structure from a three-dimensional, and in particular medical, data set while making allowance for user corrections that includes re-calculation of the nodes of the model (M) in weighted consideration of the nodes that have been displaced manually, which is the method that claim 1 is directed to.

Most important, the Office Action on pages 2-3 admits that "the prior art docs not teach re-calculation of the nodes of the model (M) in weighted consideration of the nodes

that have been displaced manually." Therefore claim 1 is not obvious in view of ¶[0007] of Applicants' specification alone.

Claim 1 is shown above. Claims 2-5 depend directly on claim 1 and incorporate the subject matter of claim 1 and contain additional subject matter. As claim 1 is not obvious for the above reasons, therefore these claims also are not obvious in view of Applicants' specification alone.

Cohen et al., Finite Element Methods for Active Contour Models and Balloons for 2D and 3D images, published November 5, 1991

Cohen shows a 3D generalization of the balloon model as a 3D deformable surface. See Cohen, Abstract. The surface is deformed under the action of internal and external forces attracting the surface toward detected edgels by an attraction potential. Ibid. Cohen shows two approaches for solving the minimization problem for a surface, first by defining a 3D surface as a series of 2D planar curves, then by solving a 3D model using the Finite Element Method after comparing the Finite Element Method and Finite Difference method in the 2D problem. Ibid.

Cohen fails to teach or suggest a method of segmenting a three-dimensional structure from a three-dimensional, and in particular medical, data set while making allowance for user corrections that includes re-calculation of the nodes of the model (M) in weighted consideration of the nodes that have been displaced manually, as is the method that claim 1 is directed to. Therefore Cohen fails to cure the defects of the discussion of the prior art in ¶[0007] of Applicants' specification.

As Cohen fails to cure the defects of the prior art referenced in ¶[0007] of Applicants' specification, therefore claim 1 is not obvious in view of ¶[0007] of Applicants' specification and Cohen, alone or in combination.

Claims 2-5 depend directly on claim 1 and incorporate all of the subject matter of this claim and contain additional subject matter. Therefore these claims also are not obvious in view of ¶[0007] of Applicants' specification and Cohen, alone or in combination. Applicants respectfully request that rejection of claims 1-5 under 35 U.S.C. §103(a) be withdrawn.

Claims as amended comply with 35 U.S.C. §101

The Office Action on page 4 rejects claims 5 under 35 U.S.C. §101, alleging that the claimed invention is not supported by either a positively asserted utility or a well established utility.

Claim 5 as here amended is directed to a computer program for a control unit for controlling a memory unit, an image-reproduction unit, a calculating unit and a positioning unit of an image-processing arrangement, wherein the program is embedded in a computer-readable medium, for controlling the image-processing arrangement as claimed in Claim 4.

Applicants assert that claim 5 as here amended is supported by a well established utility, and is in compliance with 35 U.S.C. §101. Applicants respectfully request that this rejection be withdrawn.

Claims as amended comply with 35 U.S.C. §112 ¶1

The Office Action on page 5 rejects claim 5 under 35 U.S.C. §112 ¶1, alleging that the claimed invention is not supported by either a positively asserted utility or a well established utility, and that one skilled in the art would not know how to use the claimed invention.

Claim 5 as here amended is directed to a computer program for a control unit for controlling a memory unit, an image-reproduction unit, a calculating unit and a positioning

unit of an image-processing arrangement, wherein the program is embedded in a computer-readable medium, for controlling the image-processing arrangement as claimed in Claim 4.

Applicants assert that claim 5 as here amended is supported by a well established utility, and is in compliance with 35 U.S.C. §112 ¶1. Applicants respectfully request that this rejection be withdrawn.

Summary

On the basis of the foregoing reasons, Applicants respectfully submit that the pending claims are in condition for allowance, which is respectfully requested.

If there are any questions regarding these remarks, the Examiners are invited and encouraged to contact Applicants' representative at the telephone number provided.

Respectfully submitted,

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